

# Graded Approach for Facility Work

Los Alamos National Laboratory  
Laboratory Implementation Guidance LIG 230-01-02.0  
Issue Date: 12/24/97

Non-Mandatory Document

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## 1.0 Introduction, Purpose, Scope and Applicability

Good business practice dictates that a graded approach be used to ensure that facility work is subjected to a level of management control commensurate with the importance of the structure, system, or component to safety, environmental compliance, Safeguards and Security, programmatic importance, magnitude of the hazard, and financial impact. To ensure Laboratory-wide consistency in formality of operations, an institutional graded approach is applied to all facility work.

This document provides implementing guidance to support meeting the performance requirements in LIR 230-01-02, Graded Approach for Facility Work; LPR 230-01-00, Managing Facility Assets; LPR 220-01-00, Managing Facility Projects; LPR 220-05-00, Project Execution; LPR 220-03-00, Engineering Design; and LPR 210-02-00, Define Work.

The effective date of this document is the issue date.

## 2.0 Definitions

### 2.1 Acronyms

**CFR**-Code of Federal Regulations  
**DOE**-Department of Energy  
**FM**-Facility Manager or his/her designee  
**FSS**-Facilities, Security and Safeguards  
**IFMPO**-Institutional Facility Management Program Office  
**LIR**-Laboratory Implementation Requirement  
**LPR**-Laboratory Performance Requirement  
**M**-Million  
**MEL**-Master Equipment List  
**ML**-Management Level  
**OIC**-Office of Institutional Coordination  
**PP & PE**-Personal Property and Programmatic Equipment  
**RP & IE**-Real Property and Installed Equipment  
**SNM**-Special Nuclear Material  
**SSC**-Structure(s), System(s), and/or Components(s)

### 2.2 Terms

**facility**-It is the intent of this LIG to give the broadest definition possible to the word facility. Facilities, as RP&IE is defined as land, buildings, and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, including site development features outside the plant, such as landscaping, roads, walks, and parking areas; outside lighting and communication system; central

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utility plants; utilities supply and distribution systems; and other physical plant features. It includes structures, systems, and components.

**facility work**-It is the intent of this LIG to give the broadest definition possible to the words facility work. Facility work is any work performed on a facility/RP&IE or its structures, systems, and components and the efforts required to perform that work. It is intended to cover the entire spectrum from -- e.g., a simple changing of a light bulb to -- e.g., a \$100M new facility construction project.

**graded approach**-This LIG defines graded approach as the depth of detail required and the magnitude of resources expended for a particular management element to be tailored to be commensurate with the relative importance of facility work to safety and health, environmental protection, security, and mission.

**management level determination**-A classification system for determining the degree of management control applied to facility work.

**management level 1 (ML1)**-Rigorous application of applicable codes, standards, procedural controls, verification activities, documentation requirements, and formalized maintenance program. Could include facility work for which independent review and management approvals for such things as design verification, procurement, fabrication, installation, assembly, and construction are considered essential.

**management level 2 (ML2)**-Selective application of applicable codes, standards, procedural controls, verification activities, documentation requirements, and formalized maintenance program (i.e., certain elements may require extensive controls, while others may only require limited control measures). Could include facility work that may require independent review, management approval, and verification of design outputs, surveillance during procurement, fabrication, installation, assembly, and construction.

**management level 3 (ML3)**-Application of appropriate codes, standards, procedural controls, verification activities, and documentation requirements that are consistent with recognized industry practices. Could include facility work that is normally manufactured, installed, assembled, and/or constructed in accordance with recognized codes and standards.

**management level 4 (ML4)**-No formal management controls required, follow standard policy and procedures (i.e., activities where codes and standards are not applicable).

**structure, system, and component (SSC)**-Structure, System, and Component are defined as -- "Structure is an element, or a collection of elements to provide support or enclosure such as a building, free standing tank, basins, dikes, or stacks; System is a collection of components assembled to perform a function such as piping, cable trays, conduits, or heating, ventilation, and air conditioning; and Component is an item of

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equipment such as a pump, valve, or relay , or an element of a larger array such as a length of pipe, elbow, or reducer.

**personal property and programmatic equipment (PP&PE)**-Property and equipment used purely for programmatic purposes, such as reactors, accelerator machinery, chemical processing lines, lasers, computers, machine tools, etc., and the support equipment dedicated to the programmatic purpose. This property and equipment is also referred to as organizational, research, production, operating, or process. This LIG does not apply to PP&PE; however, it is recommended that consideration be given to the application of the graded approach to PP&PE.

**master equipment list (MEL)**-A detailed list of the significant active components and equipment within a building that are included in the maintenance program. The components and equipment should be assigned to a category of importance/management level in accordance with this graded approach.

**worker versus public**-Laboratory workers have accepted some risks, while the public has accepted no risks from the operation of the Laboratory. Laboratory “worker” refers to an employee, contractor, subcontractor’s employee, associate, affiliate, visiting scientist, or anyone in an officially recognized work arrangement with the Laboratory while in work status. The “public” refers to anyone not in work status at a Laboratory facility or subcontractor’s facility.

## 3.0 Precautions and Limitations

Unfortunately the application of a graded approach process is not objective. It is a subjective process being used in a realm of changing requirements open to interpretations and extrapolations. The information presented in this document may not be all inclusive. In using this LIG common sense should prevail. The intent of this LIG is to assist in determining the depth of detail required of the various management elements associated with the planning and execution of facility work. It is not the intent of this LIG to define these requirements in detail or to discuss the procedures that may be associated with them. If a requirement is listed as “not required” at a particular management level, this does not mean that it cannot be done if deemed appropriate by the FM.

## 4.0 Guidance

The application of the institutional graded approach process requires two steps:

### 4.1 Determine Management Level

The FM determines the management level of the facility work. Attachment 8.1 is a management level determination summary matrix.

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## **4.1.1 Maintenance Work**

The facility manager develops a MEL and determines the ML level for listed equipment and components based on the consequences of the failure of the listed items. For preventive maintenance, repair, equipment modifications, and equipment replacements, the ML for the work is the ML assigned to the equipment. See LIR 230-04-01 Maintenance Management Program

## **4.1.2 Other Work**

Attachment 8.2, Management Level Determination for other than Maintenance Work, describes a step-by-step process for use in determining the management level of facility work other than maintenance.

## **4.2 Determine Required Management Elements**

The FM determines the depth of detail required for the various management elements based upon the management level determination.

- **Maintenance Work**

The rigor and level of formality for each management level for maintenance work is detailed in LIR 230-04-01 Maintenance Management Program.

- **Other Work**

The rigor and formality for each management level for facility work other than maintenance is detailed in Attachment 8.3.

Once these two steps are completed, the facility work can be planned and executed in accordance with the management level determination and associated requirements. If the scope of the facility work changes, this process shall be applied to the newly defined facility work.

The FM has the discretion to divide work into smaller pieces to lower the management level determination and thus the formality and rigor applied to the work. Each piece would be defined as facility work and would require the application of the institutional graded approach process.

## **5.0 Documentation**

**5.1** The Master Equipment List for maintenance work

**5.2** Management Level Determination forms and associated key factor sheets for ML1 and ML2 facility work other than maintenance should be maintained as records. Attachment 8.2 contains the MLD form.

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## 7.0 References

### 7.1 Document Ownership

The office of institutional coordination (OIC) for this document is the FSS Institutional Facility Management Program Office (FSS-IFMPO).

### 7.2 Documents

10 CFR 830.120, Quality Assurance Requirements

DOE Order 430.1, Life Cycle Asset Management

DOE Order 5700.6C, Quality Assurance

DOE Glossary

LIR 230-01-02, Graded Approach for Facility Work

LIR 230-04-01, Maintenance Management Program

LPR 230-01-00, Managing Facility Assets

## 8.0 Attachments

8.1 Management Level Determination Summary Matrix

8.2 Management Level Determination for Work Other Than Maintenance

8.3 Management Element Matrix for Work Other Than Maintenance

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ATTACHMENT 8.1

## MANAGEMENT LEVEL DETERMINATION Summary Matrix

| Management Level (ML) | Key Factors   |  |   |  |
|-----------------------|---|--|---|--|
|                       | Safety and Health   | Environmental Consequences   | Security  | Mission Impact   |
| <b>ML1</b>            | Could cause serious injury or death to a member of the public.  | Could cause severe long term damage to the environment beyond Laboratory boundary. |   |  |
| <b>ML2</b>            | Could result in serious injury or death to a worker or minor injury or illness to a member of the public. | Could cause severe long term damage to the environment within Laboratory boundary. | Could allow loss or theft of Category I or II quantities of SNM or national security information. | Could cause loss of use of major facility or process resulting in severe mission or economic impact. |
| <b>ML3</b>            | May cause minor injury or illness a worker. No impact on a member of the public.                          | Could cause minimal environmental consequences.                                    | Could allow loss or theft of Category III or IV quantities of SNM or classified information.      | Could cause damage to a facility or process resulting in serious mission or economic impact.         |
| <b>ML4</b>            | No probable impact on a worker or a member of the public.   | No probable impact on the environment.   | No probable loss or theft of SNM or secure information.   | Could cause minimal impact to mission.   |

Specific criteria are specified in Attachment 8.2, Management Level Determination for Other Than Maintenance Work

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Attachment 8.2

## MANAGEMENT LEVEL DETERMINATION

### For Work Other Than Maintenance

This attachment was developed as a step-by-step process for use in determining the management level of facility work other than maintenance.

The first step in applying the institutional graded approach process is the determination of the management level of the facility work. The FM convenes a Management Level Determination Board (MLDB) to determine the management level to be applied to the facility work. The graded approach should also be applied to the makeup of the MLDB. If the FM believes the Management Level Determination (MLD) for the work will likely be ML4, the MLDB could simply be one individual. If the FM believes the MLD for the work (e.g., a large complex project) will likely be ML1, the board could be made up of the FM, the user, a project engineer, a health and safety specialist, and/or a risk analyst. The make up of the MLDB is at the discretion of the FM. The Board's make up should be documented on Form 8.2 MLD.

Four key factors are used in determining the management level of facility work. They are:

1) safety and health 2) environmental consequences 3) security 4) mission impact

A management level is assigned to each of these four key factors, then the management level determination is simply the highest of the four.

Key factors 1 through 4 are matrices listing criteria for each of the four management levels. The MLDB uses these to determine the management level to be assigned to each of the key factors. Simply check the box of the criterion that applies. The corresponding management level is then assigned to that key factor. These assignments are then documented on Form 8.2 MLD. The management level determination is then made and documented on Form 8.2 MLD. Form 8.2 MLDs and associated key factor sheets for ML1 and ML2 work are maintained as records.

### References:

- 1) DOE-STD-3009-94, Preparation Guide for US DOE Nonreactor Nuclear Facility Safety Analysis Reports
- 2) DOE Order 5633.3B, Control and Accountability of Nuclear Materials

### Acronyms:

**ALARA**-As Low As Reasonably Achievable

**DOE**-Department of Energy

**ERPG**-Emergency Response Planning Guidance

**FM**-Facility Manager or his/her designee

**ID**-Identification

**LANL**-Los Alamos National Laboratory

**ML**-Management Level

**MLD**-Management Level Determination

**MLDB**-Management Level Determination Board

**OSHA**-Occupational Safety and Health Act

**SSC**-Structure(s), System(s), and/or Component(s)

**STD**-Standard

**US**-United States

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|  |  |                  |                              |                       |                 |
|--|--|------------------|------------------------------|-----------------------|-----------------|
| Work ID  | <h2 style="margin: 0;">MANAGEMENT LEVEL DETERMINATION</h2> | Date             |                              |                       |                 |
| <b>Description of Work (use additional pages if necessary)</b><br><br><br><br><br> |  |                  |                              |                       |                 |
| <b>Management Level Determination Board</b>  |  |                  |                              |                       |                 |
| <u>Name</u>  | <u>Organization</u>  | <u>Telephone</u> | <u>e-mail Address</u>        | <u>Title/Function</u> |                 |
| 1  |  |                  |                              |                       |                 |
| 2  |  |                  |                              |                       |                 |
| 3  |  |                  |                              |                       |                 |
| 4  |  |                  |                              |                       |                 |
| 5  |  |                  |                              |                       |                 |
| <b>Management Level Determination</b>  |  |                  |                              |                       |                 |
| <u>Key Factor</u>  | <u>ML1</u>   | <u>ML2</u>       | <u>ML3</u>                   | <u>ML4</u>            | <u>Comments</u> |
| 1 Safety and Health  |  |                  |                              |                       |                 |
| 2 Environmental Consequences   |  |                  |                              |                       |                 |
| 3 Security   |  |                  |                              |                       |                 |
| 4 Mission Impact   |  |                  |                              |                       |                 |
| <b>Management Level Determination</b>  | <b>Date</b>  |                  | <b>FM Approval Signature</b> |                       |                 |

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## MANAGEMENT LEVEL DETERMINATION

### Key Factor 1, Safety and Health

| ML  | Criteria  |
|-----|---|
| ML1 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC is designated as safety class per DOE-STD-3009-94.</li><li><input type="checkbox"/> SSC failure could cause the failure of another safety class SSC or prevent it from performing its required function.</li><li><input type="checkbox"/> SSC is required to support another safety class SSC.</li><li><input type="checkbox"/> SSC serves to limit the consequences of an accidental 1) radiological release that would potentially exceed 25 rem or 2) chemical release that would potentially exceed ERPG-2 per DOE-STD-3009-94 at the site boundary.</li><li><input type="checkbox"/> SSC serves to either prevent or mitigate accidents that would result in the death or serious injury or illness of a member of the public.</li></ul>  |
| ML2 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC is designated as safety significant per DOE-STD-3009-94.</li><li><input type="checkbox"/> SSC failure could cause the failure of another safety significant SSC or prevent it from performing its required function.</li><li><input type="checkbox"/> SSC is required to support another safety significant SSC.</li><li><input type="checkbox"/> SSC failure could cause or allow release of radioactive material with a potential radiological dose less than 25 rem or releases of chemicals with a potential dose less than ERPG-2 per DOE-STD-3009-94 at the site boundary.</li><li><input type="checkbox"/> SSC provides defense in depth, backup, or redundancy to a safety class SSC.</li><li><input type="checkbox"/> SSC failure could result in death or serious (disabling) injury or illness to a worker.</li><li><input type="checkbox"/> SSC failure could result in minor injury, irritation, annoyance, or illness to a member of the public.</li></ul> |
| ML3 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC is important to safety or if its failure could cause only minimal off-site impact. Included are those related to standard industrial safety, life safety, ALARA programs, and/or prescribed by OSHA.</li><li><input type="checkbox"/> SSC failure causes no impact on public but could cause minor injury or illness to a worker.</li></ul>  |
| ML4 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could neither cause nor allow any significant health effects to workers or the public nor cause or contribute to off-site radiological or chemical releases.</li></ul>   |

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## MANAGEMENT LEVEL DETERMINATION

### Key Factor 2, Environmental Consequences

| ML  | Criteria   |
|-----|--|
| ML1 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could cause or allow severe long term damage to the environment beyond Laboratory boundaries. Severe long term damage means that recovery of the resource would take 10 years or longer and a damaged area would not be usable in the interim. Extensive remediation would have to be performed to return the resource to its original state.</li><li><input type="checkbox"/> SSC failure could cause or allow damage to threatened or endangered species, wetlands, or protected historical or archeological sites.</li></ul> |
| ML2 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could cause or allow severe long term damage to the environment within Laboratory boundaries.</li><li><input type="checkbox"/> SSC failure could cause or allow damage to commercial resources such agricultural, recreational, or business properties.</li></ul>   |
| ML3 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could cause or allow minimal environmental consequences. Recovery could be rapid with or without remediation.</li></ul>   |
| ML4 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could result in no detectable impact to the environment.</li></ul>  |

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Key Factor 3, Security

| ML  | Criteria  |
|-----|---|
| ML1 | Not applicable.   |
| ML2 | <input type="checkbox"/> SSC protects Category I or II (per DOE Order 5633.3B) quantities of special nuclear material, special access programs, sensitive compartmented information vaults or vault type rooms, or national security information. |
| ML3 | <input type="checkbox"/> SSC protects Category III or IV quantities of special nuclear material, or classified information.   |
| ML4 | <input type="checkbox"/> There is no potential for security violations.   |

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## MANAGEMENT LEVEL DETERMINATION

### Key Factor 4, Mission Impact

| ML  | Criteria   |
|-----|--|
| ML1 | Not applicable.  |
| ML2 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could measurably degrade LANL's ability to meet its mission.</li><li><input type="checkbox"/> SSC failure could cause mission objectives to be delayed.</li><li><input type="checkbox"/> SSC failure could significantly degrade the quality of work done at LANL, schedule performance, and/or standing of LANL within the scientific community.</li><li><input type="checkbox"/> SSC failure could result in the lack of capability to perform new tasks or provide new services.</li><li><input type="checkbox"/> SSC failure could result in an economic loss to LANL of \$10 to \$500 million.</li><li><input type="checkbox"/> The potential exists for non-compliance with statutory requirements should appropriate management controls not be implemented. Non-compliance means the Laboratory could fail to meet an enforceable obligation imposed by a statutory environmental requirement, a civil judicial enforcement action (such as a court order), or enforceable obligations in the operating contract.</li><li><input type="checkbox"/> The potential exists for situations that may result in monetary or contractual penalties, an administrative notification action by a regulatory agency (such as a notice of non-compliance), or a charge that LANL is responsible for reckless and knowing failure to take actions necessary to prevent an imminent and substantial endangerment to public health, welfare, or the environment.</li><li><input type="checkbox"/> The potential exists for non-compliance with the DOE nuclear safety rules in the Code of Federal Regulations. (Note: OSHA compliance is not normally considered to result in an ML-2 assessment.)</li></ul> |
| ML3 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could degrade LANL's ability to meet strategic plan milestones or milestones that are directed by the DOE.</li><li><input type="checkbox"/> SSC failure could result in measurable decreases in schedule or quality performance.</li><li><input type="checkbox"/> SSC failure could result in an economic loss to LANL of no greater than \$10 million.</li><li><input type="checkbox"/> The potential exists for non-compliance with project agreements should appropriate management controls not be implemented. Non-compliance means that LANL could fail to meet a non-legally binding or non-enforceable agreement (such as a memorandum of understanding), an internal contractual agreement of commitment, a DOE Order or standard, industry codes or standards invoked by DOE Orders or standards, or an obligation imposed by an environmental statute not generally subject to formal enforcement action.</li></ul>  |
| ML4 | <ul style="list-style-type: none"><li><input type="checkbox"/> SSC failure could cause minor damage to a facility or process resulting in mission interruption or inconvenience.</li><li><input type="checkbox"/> There is no potential for regulatory violations.</li></ul>   |

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Attachment 8.3

## **MANAGEMENT ELEMENT MATRIX For Work Other Than Maintenance**

Once the management level determination is made the next step is to determine the depth of detail required for the various management elements to be used in planning and executing the facility work. Following is a Management Element Matrix, which lists management elements, reference sources, and the depth of detail required by management level. This list is certainly not an all-inclusive list. As users of this LIG, identify additional management elements that apply institutionally and bring them to the attention of IFMPO so that additions may be incorporated into this matrix. FM's have the discretion of adding FMU specific management elements and determining the depth of detail required of them in planning and executing facility work.

### **References:**

DOE Order 430.1 Life Cycle Asset Management  
DOE Order 5700.6C Quality Assurance  
10 CFR 830.120 Quality Assurance Requirements  
GPG-FM-001 Project Management Overview  
GPG-FM-002 Critical Design Criteria  
GPG-FM-003 Engineering Tradeoff Studies  
GPG-FM-004 Reliability, Maintainability, Availability (RMA) Planning  
GPG-FM-005 Test and Evaluation  
GPG-FM-006 Performance Analysis and Reporting  
GPG-FM-007 Risk Analysis and Management  
GPG-FM-008 Work Scope Planning  
GPG-FM-009 Baseline Change Control  
GPG-FM-010 Project Execution and Engineering Management Planning  
GPG-FM-012 Configuration Data and Management  
GPG-FM-015 Project Reviews  
GPG-FM-016 Baseline Development  
GPG-FM-017 Quality Assurance  
GPG-FM-019 Project Budget Process  
GPG-FM-020 Performance Measurement  
GPG-FM-021 Environmental Interfaces  
GPG-FM-022 Public Participation  
GPG-FM-025A Waste Minimization/Pollution Prevention  
GPG-FM-026A Project Closeout  
GPG-FM-027 Human Factors Engineering  
GPG-FM-031 Maintenance  
GPG-FM-032A Life-Cycle Cost

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## Acronyms:

**CEP**-Construction Execution Plan  
**CFR**-Code of Federal Regulations  
**CMP**-Configuration Management Plan  
**DOE**-Department of Energy  
**F & OR**-Functional and Operational Requirements  
**FM**-Facility Manager or his/her designee  
**FMU**-Facility Management Unit  
**GPG**-Good Practice Guide  
**GPG-FM**-GPG Field Management  
**IFMPO**-Institutional Facility Management Program Office  
**LIR**-Laboratory Implementation Requirements  
**M**-Million  
**ML**-Management Level  
**NEPA**-National Environmental Protection Act  
**O**-Order  
**PCS**-Project Controls System  
**PEP**-Project Execution Plan  
**POD**-Plan of the Day  
**POW**-Plan of the Week  
**QAP**-Quality Assurance Plan  
**RCRA**-Resource Conservation and Recovery Act  
**RMA**-Reliability, Maintainability, Availability  
**RMP**-Risk Management Plan  
**SAR**-Safety Analysis Report  
**SEMP**-System Engineering Management Plan  
**SP**-Safety Plan  
**T & I**-Test and Inspection  
**TEC**-Total Estimated Cost  
**TP**-Turnover Plan  
**TPC**-Total Project Cost  
**VE**-Value Engineering  
**WBS**-Work Breakdown Structure  
**WEP**-Work Execution Plan  
**WMP**-Waste Management Plan

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE MANAGEMENT

### General

| Mgt. Element  | Reference(s)  | ML-1   | ML-2  | ML-3   | ML-4   |
|---|---|--|---|--|--|
| Quality Assurance Plan (QAP)                              | <ul style="list-style-type: none"> <li>•10 CFR 830.120</li> <li>•DOE O 5700.6C</li> <li>•DOE O 430.1</li> <li>•GPG-FM-017</li> </ul>                                    | Develop and use specific QAP addressing all 10 criteria -- program, personnel training and qualification, quality improvement, documents and records, work processes, design, procurement, inspection and acceptance, management assessment, and independent assessment                                  | Develop and use specific QAP addressing program, documents and records, work processes, design, procurement, and inspection and acceptance; use generic plan addressing personnel training and qualification, quality improvement, management assessment, and independent assessment                | Use generic plan addressing all 10 criteria  | Use generic plan addressing documents and records and procurement  |
| Work Execution Plan (WEP) or Project Execution Plan (PEP) | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-002</li> <li>•GPG-FM-010</li> <li>•GPG-FM-019</li> <li>•GPG-FM-022</li> </ul> | Develop and use specific WEP/PEP addressing mission need justification; critical decision criteria; budget process; organization structure; baseline: scope, schedule, and cost; work controls; acquisition strategy; interface control; public involvement; and document control and records management | Develop and use specific WEP/PEP addressing mission need justification; critical decision criteria; budget process; organization structure; baseline: scope, schedule, and cost; controls; acquisition strategy; interface control; public involvement; and document control and records management | Use generic WEP/PEP addressing organization structure; budget process; baseline: scope, schedule, and cost; project controls; acquisition strategy; interface control; and document control and records management | Use generic WEP/PEP addressing budget process; baseline: scope, schedule, and cost; work controls; and document control and records management |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE MANAGEMENT (continued)

### *Environmental, Safety and Health*

| Mgt. Element                            | Reference(s)  | ML-1  | ML-2  | ML-3   | ML-4   |
|---|---|---|---|--|--|
| Environmental Laws --NEPA, RCRA, et al. | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-021</li> </ul>                       | Full compliance with federal and state environmental laws   | Full compliance with federal and state environmental laws   | Full compliance with federal and state environmental laws                    | Full compliance with federal and state environmental laws                    |
| Safety Analysis Report (SAR)            | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-010</li> </ul>                       | Develop and use project specific SAR  | Develop and use project specific SAR  | Not required   | Not required   |
| Safety Plan (SP)                        | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> </ul>  | Develop and use project specific SP addressing the five-step Integrated Safety Management process | Develop and use project specific SP addressing the five-step Integrated Safety Management process | Use generic SP addressing the five-step Integrated Safety Management process | Use generic SP addressing the five-step Integrated Safety Management process |
| Waste Management Plan (WMP)             | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-025A</li> </ul> | Develop and use specific WMP addressing waste prevention, reduction, and minimization             | Develop and use specific WMP addressing waste prevention, reduction, and minimization             | Use generic WMP addressing waste prevention, reduction, and minimization     | Use generic WMP addressing waste prevention, reduction, and minimization     |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE MANAGEMENT (continued)

### Controls

| Mgt. Element                                   | Reference(s)   | ML-1  | ML-2  | ML-3  | ML-4  |
|--|--|---|---|---|---|
| Risk Assessment and Risk Management Plan (RMP) | <ul style="list-style-type: none"> <li>•DOE 0 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-007</li> <li>•GPG-FM-010</li> </ul>  | Perform a risk assessment and develop a specific RMP addressing quality requirements, environmental considerations, technology, regulatory involvement, interfaces, funding, safety, time, complexity, number of key participants, magnitude /type of contamination, political visibility, public involvement, contractor availability/capability, and labor skills, availability, and productivity | Perform a risk assessment and develop a specific RMP addressing quality requirements, environmental considerations, technology, regulatory involvement, interfaces, funding, safety, time, complexity, number of key participants, magnitude /type of contamination, contractor availability/capability, and labor skills, availability, and productivity | Perform a risk assessment and use a generic RMP addressing quality requirements, environmental considerations, regulatory involvement, funding, safety, time, magnitude /type of contamination contractor availability/capability, and labor skills, availability, and productivity | No risk assessment or RMP required.                                 |
| Project Controls System (PCS)                  | <ul style="list-style-type: none"> <li>•DOE 0 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-006</li> <li>•GPG-FM-008</li> <li>•GPG-FM-010</li> <li>•GPG-FM-016</li> <li>•GPG-FM-020</li> <li>•GPG-FM-026A</li> </ul> | Use a PCS addressing work scope planning; the development of scope, schedule, and cost baselines; WBS development; work authorization; performance measurement, analysis, and reporting; and work close out   | Use a PCS addressing the development of scope, schedule, and cost baselines; WBS development; work authorization; performance measurement and reporting; and work close out   | Use a PCS addressing the development of scope, schedule, and cost baselines; work authorization; tracking and reporting costs   | Use a PCS addressing defining work and tracking and reporting costs |
| Baseline Change Control                        | <ul style="list-style-type: none"> <li>•DOE 0 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-009</li> </ul>   | Use a baseline control process addressing scope, schedule, and cost baselines; thresholds; authorities; Baseline Change Control Board; use of management reserve and contingency; procedures; documentation; reporting; and re-programming and re-baselining  | Use a baseline control process addressing scope, schedule, and cost baselines; thresholds; authorities; Baseline Change Control Board; use of management reserve and contingency; procedures; documentation; reporting; and re-programming and re-baselining  | Use a baseline control process addressing scope, schedule, and cost baselines; thresholds; authorities; procedures; and documentation   | A change control process is not required                            |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE ENGINEERING

| Mgt. Element  | Reference(s)   | ML-1  | ML-2  | ML-3   | ML-4   |
|---|--|---|---|--|--|
| Functional & Operational Requirements (F&OR)              | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-008</li> <li>•GPG-FM-010</li> </ul>  | Develop an F&OR document describing all of the functional and operational requirements of the program, user, and FM                 | Develop an F&OR document describing all of the functional and operational requirements of the program, user, and FM | Develop a statement of work  | Develop a statement of work  |
| Configuration Management Plan (CMP)                       | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-010</li> <li>•GPG-FM-012</li> </ul>  | Develop and use specific CMP addressing the technical baseline, interfaces with existing systems, change control, and documentation | Develop and use specific CMP addressing the technical baseline, change control, and documentation                   | Use generic plan addressing technical baseline and change control                          | Use engineering design change process  |
| Life-Cycle Cost   | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-010</li> <li>•GPG-FM-032A</li> </ul> | Determination of life-cycle costs is required for work with a TPC greater than \$20M  | Determination of life-cycle costs is required for work with a TPC greater than \$20M                                | Determination of life-cycle costs is required for work with a TPC greater than \$20M       | Determination of life-cycle costs is required for work with a TPC greater than \$20M |
| Reliability, Maintainability, Availability (RMA) Analysis | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-004</li> <li>•GPG-FM-010</li> <li>•GPG-FM-031</li> </ul>  | Incorporate an RMA analysis into the engineering design effort  | Consider the incorporation of an RMA analysis into the engineering design effort                                    | Consider the incorporation of an RMA analysis into the engineering design effort           | Not required   |
| Human Factors Engineering                                 | <ul style="list-style-type: none"> <li>•GPG-FM-010</li> <li>•GPG-FM-027</li> </ul>   | Incorporate human factors engineering into the engineering design effort  | Consider the incorporation of human factors engineering into the engineering design effort                          | Consider the incorporation of human factors engineering into the engineering design effort | Not required   |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE ENGINEERING (continued)

| Mgt. Element  | Reference(s)  | ML-1   | ML-2   | ML-3   | ML-4   |
|---|---|--|--|--|--|
| Execution/Management                                    | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-010</li> <li>•GPG-FM-015</li> </ul> | Use an engineering execution/management system addressing drawing, specification, and calculation preparation, checking, and approval; design review, verification, and validation including independent peer reviews of all efforts; cost and schedule estimates; design clarification/change process; submittal reviews; and as-built updating | Use an engineering execution/management system addressing drawing, specification, and calculation preparation, checking, and approval; design review, verification, and validation including peer reviews of major efforts; cost and schedule estimates; design clarification/change process; submittal reviews; and as-built updating | Use an engineering execution/management system addressing drawing, specification, and calculation preparation, checking, and approval; design review; design clarification/change process; and as-built updating | Use an engineering execution/management system addressing drawing, specification, and calculation preparation, checking, and approval; and as-built updating |
| Test and Inspection Plan (T&I Plan)                     | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-005</li> <li>•GPG-FM-010</li> </ul>                      | Develop and use specific T&I Plan addressing requirements, approach, verification methods, acceptance criteria, and documentation  | Develop and use specific T&I Plan addressing requirements, approach, verification methods, acceptance criteria, and documentation  | Use generic plan addressing requirements, approach, verification methods, acceptance criteria, and documentation   | Use generic plan addressing requirements, acceptance criteria, and documentation   |
| Value Engineering (VE) and Engineering Tradeoff Studies | <ul style="list-style-type: none"> <li>•DOE O 430.1</li> <li>•GPG-FM-001</li> <li>•GPG-FM-003</li> <li>•GPG-FM-010</li> </ul> | VE studies are required for work with a TEC greater than \$1M, recommended for projects where suspect potential for substantial cost savings; perform engineering tradeoff studies   | VE studies are required for work with a TEC greater than \$1M, recommended for projects where suspect potential for substantial cost savings; consider performing engineering tradeoff studies   | VE studies are required for work with a TEC greater than \$1M, recommended for projects where suspect potential for substantial cost savings   | VE studies are required for work with a TEC greater than \$1M, recommended for projects where suspect potential for substantial cost savings                 |
| Systems Engineering Management Plan (SEMP)              | <ul style="list-style-type: none"> <li>•GPG-FM-001</li> <li>•GPG-FM-010</li> </ul>  | Develop and use work specific SEMP addressing the system engineering process   | Develop and use work specific SEMP addressing the system engineering process   | Not required   | Not required   |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE CONSTRUCTION

| Mgt. Element                      | Reference(s)   | ML-1  | ML-2  | ML-3   | ML-4   |
|-----------------------------------|--|---|---|--|--|
| Construction Execution Plan (CEP) | <ul style="list-style-type: none"><li>•DOE O 430.1</li><li>•GPG-FM-001</li><li>•GPG-FM-010</li></ul> | Develop and use specific CEP addressing coordination, inspection, testing, acceptance, change orders, planning and scheduling, POD/POW, contractor safety, field diary, punch list resolution, as-built support, reporting, construction acceptance, and contract close-out | Develop and use specific CEP addressing coordination, inspection, testing, acceptance, change orders, planning and scheduling, POD/POW, contractor safety, field diary, punch list resolution, as-built support, reporting, construction acceptance, and contract close-out | Develop and use generic CEP addressing coordination, inspection, testing, acceptance, change orders, planning and scheduling, POD/POW, contractor safety, field diary, punch list resolution, as-built support, reporting, construction acceptance, and contract close-out | Develop and use generic CEP addressing coordination, inspection, testing, acceptance, change orders, planning and scheduling, POD/POW, contractor safety, field diary, punch list resolution, as-built support, reporting, construction acceptance, and contract close-out |

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## MANAGEMENT ELEMENT MATRIX FOR FACILITY WORK OTHER THAN MAINTENANCE TURNOVER

| Mgt. Element          | Reference(s)   | ML-1  | ML-2  | ML-3   | ML-4   |
|-----------------------|--|---|---|--|--|
| Turnover Plan (TP)    | <ul style="list-style-type: none"><li>•DOE O 430.1</li><li>•GPG-FM-010</li></ul> | Develop and use specific TP addressing the design, operations and maintenance, and test and inspection documentation to be turned over to the FMU; FMU training requirements; and readiness demonstration | Develop and use specific TP addressing the design, operations and maintenance, and test and inspection documentation to be turned over to the FMU; FMU training requirements; and readiness demonstration | Use generic plan addressing the design, operations and maintenance, and test and inspection documentation to be turned over to the FMU and readiness demonstration | Use generic plan addressing the design, operations and maintenance, and test and inspection documentation to be turned over to the FMU and readiness demonstration |
| Operational Readiness |  | Perform Operational Readiness Review or Readiness Assessment  | Perform Operational Readiness Review or Readiness Assessment  | Verify and document that functional and operational requirements have been met   | Verify and document resolution of all punch list items   |